



# UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

NATIONAL EXPOSURE RESEARCH LABORATORY

HUMAN EXPOSURE & ATMOSPHERIC SCIENCES DIVISION (MD-46)

Research Triangle Park, NC 27711

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Office of

Research and Development

## LIST OF DESIGNATED REFERENCE AND EQUIVALENT METHODS

**Issue Date: May 9, 2000**

([www.epa.gov/ttn/amtic/criteria.html](http://www.epa.gov/ttn/amtic/criteria.html))

These methods for measuring ambient concentrations of specified air pollutants have been designated as "reference methods" or "equivalent methods" in accordance with Title 40, Part 53 of the Code of Federal Regulations (40 CFR Part 53). Subject to any limitations (e.g., operating range or temperature range) specified in the applicable designation, each method is acceptable for use in state or local air quality surveillance systems under 40 CFR Part 58 unless the applicable designation is subsequently canceled. Automated methods for pollutants other than PM<sub>10</sub> are acceptable for use only at shelter temperatures between 20EC and 30EC and line voltages between 105 and 125 volts unless wider limits are specified in the method description.

Prospective users of the methods listed should note (1) that each method must be used in strict accordance with its associated operation or instruction manual and with applicable quality assurance procedures, and (2) that modification of a method by its vendor or user may cause the pertinent designation to be inapplicable to the method as modified. (See Section 2.8 of Appendix C, 40 CFR Part 58 for approval of modifications to any of these methods by users.)

Further information concerning particular designations may be found in the *Federal Register* notice cited for each method or by writing to the National Exposure Research Laboratory, Human Exposure and Atmospheric Sciences Division (MD-46), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. Technical information concerning the methods should be obtained by contacting the source listed for each method. Source addresses are listed at the end of the listing of methods, except for the addresses for lead method sources, which are given with the method. New analyzers or PM<sub>10</sub> samplers sold as reference or equivalent methods must carry a label or sticker identifying them as designated methods. For analyzers or PM<sub>10</sub> samplers sold prior to the designation of a method with the same or similar model number, the model number does not necessarily identify an analyzer or sampler as a designated method. Consult the manufacturer or seller to determine if a previously sold analyzer or sampler can be considered a designated method or if it can be upgraded to designation status. Analyzer users who experience operational or other difficulties with a designated analyzer or sampler and are unable to resolve the problem directly with the instrument manufacturer may contact EPA (preferably in writing) at the above address for assistance.

This list will be revised as necessary to reflect any new designations or any cancellation of a designation currently in effect. The most current revision of the list will be available for inspection at EPA's Regional Offices, and copies may be obtained by writing to the National Exposure Research Laboratory at the address specified above.

### Most Recent Designations

|  |                  |
|--|------------------|
| Environment S.A SANOA Longpath Monitoring System (O <sub>3</sub> SO <sub>2</sub> NO <sub>2</sub> ) | May 8, 2000      |
| TNRCC Inductively Coupled Plasma-AE Spectrometry Method for lead                                   | May 8, 2000      |
| URG Corp. Model URG-MASS100 Single PM2.5 FRM Sampler   | May 8, 2000      |
| URG Corp. Model URG-MASS300 Sequential PM2.5 FRM Sampler   | May 8, 2000      |
| DKK Corp. Model GUX-113E U. V. Ozone Analyzer  | March 2, 2000    |
| DKK Corp. Model GFS-112E U.V. Fluorescence SO <sub>2</sub> Analyzer                                | January 18, 2000 |
| Andersen RAAS10-100, RAAS10-200, RAAS10-300 PM <sub>10</sub> Samplers                              | June 23, 1999    |
| Rupprecht & Patashnick Partisol® Model 2000 PM-2.5 Audit Sampler                                   | April 19, 1999   |

**CARBON MONOXIDE****Advanced Pollution Instrumentation, Inc. Model 300 CO Analyzer***Automated Reference Method: RFCA-1093-093*

"Advanced Pollution Instrumentation, Inc. Model 300 Gas Filter Correlation Carbon Monoxide Analyzer," operated on any full scale range between 0-10 ppm and 0-50 ppm, at any temperature in the range of 15EC to 35EC, with the dynamic zero and span adjustment set to *Off*, with a 5-micron TFE filter element installed in the filter assembly, and with or without any of the following options:<sup>2</sup> Internal Zero/Span (IZS); Rack Mount With Slides; Zero/Span Valves; RS-232 With Status Outputs.

[*Federal Register*: Vol. 58, page 58166, 10/29/93]

**Beckman Model 866 CO Monitoring System***Automated Reference Method: RFCA-0876-012*

"Beckman Model 866 Ambient CO Monitoring System," consisting of the following components: Pump/Sample-Handling Module; Gas Control Panel; Model 865-17 Analyzer Unit; Automatic Zero/Span Standardizer; operated with a 0-50 ppm range, a 13 second electronic response time, with or without any of the following options: Current Output Feature; Bench Mounting Kit; Linearizer Circuit.

[*Federal Register*: Vol. 41, page 36245, 08/27/76]

**Bendix/Combustion Engineering Model 8501-5CA CO Analyzer***Automated Reference Method: RFCA-0276-008*

"Bendix or Combustion Engineering Model 8501-5CA Infrared CO Analyzer", operated on the 0-50 ppm range and with a time constant setting between 5 and 16 seconds, with or without any of the following options: Rack Mounting With Chassis Slides; Rack Mounting Without Chassis Slides; External Sample Pump.

[*Federal Register*: Vol. 41, page 7450, 02/18/76]

**Dasibi Model 3003 CO Analyzer***Automated Reference Method: RFCA-0381-051*

"Dasibi Model 3003 Gas Filter Correlation Dasibi Environmental CO Analyzer," operated on the 0-50 ppm range, with a sample particulate filter installed on the sample inlet line, with or without any of the following options:

|                            |                            |  |
|----------------------------|----------------------------|--|
| 3-001 Rack Mount           | 3-003 BCD Digital Output   | 3-007 Zero/Span Module Panel                               |
| 3-002 Remote Zero And Span | 3-004 4-20 Milliamp Output | [ <i>Federal Register</i> : Vol. 46, page 20773, 04/07/81] |

**Dasibi Model 3008 CO Analyzer***Automated Reference Method: RFCA-0488-067*

"Dasibi Model 3008 Gas Filter Correlation CO Analyzer," operated on the 0-50 ppm range, with a time constant setting of 60 seconds, a particulate filter installed in the analyzer sample inlet line, with or without use of the auto zero or auto zero/span feature, and with or without any of the following options: N-0056-A RS-232-C Interface; S-0132-A Rack Mounting Slides; Z-0176-S Rack Mounting Brackets.

[*Federal Register*: Vol. 53, page 12073, 04/12/88]

**Environnement S.A. Model CO11M CO Analyzer***Automated Reference Method: RFCA-0995-108*

"Environnement S.A. Model CO11M Ambient Carbon Monoxide Analyzer," operated on a full scale range of 0 - 50 ppm, at any temperature in the range of 15 EC to 35 EC, with a 5-micron PTFE sample particulate filter, with the following software settings: Automatic response time ON; Minimum response time set to 40 seconds (RT 13); Automatic ZERO-REF cycle programmed every 24 hours; and with or without any of the following options: <sup>2</sup> RS232-422 Serial Interface; Internal Printer.

[*Federal Register*: Vol. 60, page 54684, 10/25/95]

**Horiba Models AQM-10, AQM-11, and AQM12 CO Monitoring Systems***Automated Reference Method: RFCA-1278-033*

"Horiba Models AQM-10, AQM-11, and AQM12 Ambient CO Monitoring Systems," operated on the 0-50 ppm range, with a response time setting of 15.5 seconds, with or without any of the following options: AIC-101 Automatic Indication Corrector; VIT-3 Non-Isolated Current Output; ISO-2 And DCS-3 Isolated Current Output.

[*Federal Register*: Vol. 43, page 58429, 12/14/78]

**Horiba Model APMA-300E CO Monitoring System***Automated Reference Method: RFCA-1180-048*

"Horiba Model APMA-300E Ambient Carbon Monoxide Monitoring System," operated on the 0-20 ppm<sup>1</sup>, the 0-50 ppm, or the 0-100 ppm range with a time constant switch setting of No. 5. The monitoring system may be operated at temperatures between 10EC and 40EC. (This method was originally designated as "Horiba Model APMA 300E/300SE Ambient Carbon Monoxide Monitoring System".)

[*Federal Register*: Vol. 45, page 72774, 11/03/80]

**Horiba Model APMA-360 CO Monitor***Automated Reference Method: RFCA-0895-106*

"Horiba Instruments Incorporated, Model APMA-360 Ambient Carbon Monoxide Monitor," operated on the 0-50 ppm range, with the Line Setting set to "MEASURE", with the Analog Output set to "MOMENTARY VALUE", and with or without the following options:<sup>2</sup> 1) Rack Mounting Plate and Side Rails 2) RS-232 Com Port.

[*Federal Register*: Vol. 60, page 39382, 08/02/95]

**MASS-CO, Model 1 CO Analyzer***Automated Reference Method: RFCA-1280-050*

"MASS-CO, Model 1 Carbon Monoxide Analyzer," operated on a range of 0-50 ppm, with automatic zero and span adjustments at time intervals not to exceed 4 hours, with or without the 100 millivolt and 5 volt output options. The method consists of the following components: (1) Infra-2 (Uras 2) Infrared Analyzer Model 5611-200-35, (2) Automatic Calibrator Model 5869-111, (3) Electric Gas Cooler Model 7865-222 or equivalent with prehumidifier, (4) Diaphragm Pump Model 5861-214 or equivalent, (5) Membrane Filter Model 5862-111 or equivalent, (6) Flow Meter Model SK 1171-U or equivalent, (7) Recorder Model Mini Comp DN 1/192 or equivalent. NOTE: This method is not now commercially available.

[*Federal Register: Vol. 45, page 81650, 12/11/80*]**Monitor Labs Model 8310 CO Analyzer***Automated Reference Method: RFCA-0979-041*

"Monitor Labs Model 8310 CO Analyzer," operated on the 0-50 ppm range, with a sample inlet filter, with or without any of the following options:

|                      |                  |                                  |
|----------------------|------------------|----------------------------------|
| 02A Zero/Span Valves | 04B Pump (50 Hz) | 07A Zero/Span Valve Power Supply |
| 03A Floor Stand      | 05A CO Regulator | 08A Calibration Valves           |
| 04A Pump (60 Hz)     | 06A CO Cylinder  | 9A,B,C,D Input Power Transformer |

[*Federal Register: Vol. 44, page 54545, 09/20/79 and Vol. 45, page 2700, 01/14/80*]**Monitor Labs/Lear Siegler Model 8830 CO Analyzer***Automated Reference Method: RFCA-0388-066*

"Monitor Labs or Lear Siegler Model 8830 CO Analyzer," operated on the 0-50 ppm range, with a five micron Teflon filter element installed in the rear-panel filter assembly, with or without any of the following options: 2 - Zero/Span Valve Assembly; 3 - Rack Assembly; 4 - Slide Assembly; 7 - 230 VAC, 50/60 Hz.

[*Federal Register: Vol. 53, page 7233, 03/07/88*]**Monitor Labs/Lear Siegler Model ML9830,***Automated Reference Method: RFCA-0992-088***Monitor Labs Model ML9830B, or Wedding & Associates Model 1020 CO Analyzers**

"Lear Siegler Measurement Controls Corporation or Monitor Labs Model ML9830, Monitor Labs Model ML9830B, or Wedding & Associates, Inc. Model 1020 Carbon Monoxide Analyzer," operated on any full scale range between 0-5.0 ppm<sup>l</sup> and 0-100 ppm, at any temperature in the range of 15°C to 35°C, with the service switch on the secondary panel set to the *In* position, with the following menu choices selected: Range: 5.0 ppm to 100.0 ppm; Over-ranging: *Enabled* or *Disabled*; Background: *Not Disabled*; Calibration: *Manual* or *Timed*; Diagnostic Mode: *Operate*; Filter Type: *Kalman*; Pres/Temp/Flow Comp: *On*; Span Comp: *Disabled*; and as follows: **Model ML9830:** with a five-micron Teflon® filter element installed internally, with the 50-pin I/O board installed on the rear panel configured at any of the following output range settings: Voltage, 0.1 V, 1 V, 5 V, 10 V; Current, 0-20 mA, 2-20 mA and 4-20 mA; and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); Valve Assembly for Internal Zero/Span (IZS); Rack Mount Assembly; Internal Floppy Disk Drive. **Models ML9830B and 1020:** with either a vendor-supplied or equivalent user-supplied five micron Teflon® filter and exhaust pump, and with or without any of the following options: Valve Assembly for External Zero/Span (EZS); 50-pin I/O board; Rack Mount Assembly; High Pressure Span Valve; hinged, fold-down front panel.

[*Federal Register: Vol. 57, page 44565, 09/28/92*]**MSA/LIRA Model 202S CO Analyzer System***Automated Reference Method: RFCA-0177-018*

"LIRA Model 202S Air Quality Carbon Monoxide Analyzer System," consisting of a LIRA Model 202S optical bench (P/N 459839), a regenerative dryer (P/N 464084), and rack-mounted sampling system; operated on a 0-50 ppm range, with the slow response amplifier, with or without any of the following options: Remote Meter; Remote Zero And Span Controls; 0-1, 5, 20, Or 50 mA Output; 1-5, 4-20, Or 10-50 mA Output; 0-10 Or 100 mV Output; 0-1, 5, Or 10 Volt Output.

[*Federal Register: Vol. 42, page 5748, 01/31/77*]**Thermo Electron/Thermo Environmental Instruments Models 48, 48C***Automated Reference Method: RFCA-0981-054*

"Thermo Electron or Thermo Environmental Instruments, Inc. Model 48 Gas Filter Correlation Ambient CO Analyzer," operated on the 0-50 ppm range, with a time constant setting of 30 seconds, with or without any of the following options:

|                                  |  |
|----------------------------------|--|
| 48-001 Teflon Particulate Filter | 48-010 Internal Zero Air Package                     |
| 48-002 19 Inch Rack Mount        | 48-488 GPIB (General Purpose Interface Bus) EEEE-488 |

48-003 Internal Zero/Span Valves with Remote Activation

"Thermo Electron or Thermo Environmental Instruments, Inc. Model 48C Gas Filter Correlation Ambient CO Analyzer," operated on any measurement range between 0-1 ppm<sup>l</sup> and 0-100 ppm, with any time average setting from 10 to 300 seconds, with temperature and/or pressure compensation on or off, operated at temperatures between 20 °C and 30 °C, with or without any of the following options:<sup>2</sup>

|   |                                |
|---|--------------------------------|
| 100 Teflon particulate filter   | 410 Internal Zero Air Scrubber |
| 200 Carrying Handle   | 6104-20 mA current output      |
| 210 Rack mounts   | 720 RS-232 Interface           |
| 320 Internal Zero/Span and Sample/Calibration Solenoid Valves                             | 770RS-485 Interface            |
| 330 Internal Zero/Span and Sample/ Calibration Solenoid Valves with Remote I/O Activation |                                |

[*Federal Register: Vol. 46, page 47002, 09/23/81*]

**NOTES**

<sup>1</sup> Users should be aware that designation of this analyzer for operation on ranges less than the range specified in the performance specifications for this analyzer (40 CFR 53, Subpart B) is based on meeting the same absolute performance specifications required for the specified range. Thus, designation of these lower ranges does not imply commensurably better performance than that obtained on the specified range.

<sup>2</sup> This analyzer is approved for use, with proper factory configuration, on either 50 or 60 Hertz line frequency and nominal power line voltages of 115 Vac and 220 Vac.

## Sources or Contacts for Designated Reference and Equivalent Methods

|   |   |  |
|---|---|--|
| ABB Process Analytics<br>P.O. Box 831<br>Lewisburg, WV 24901<br>(304) 647-4358  | Environnement S.A<br>111, bd Robespierre<br>78300 Poissy, France<br>Instruments also available from:<br>Altech/Environnement U.S.A.<br>2623 Kaneville Court<br>Geneva, IL 60134<br>(630) 262-4400<br>rbrown@altechusa.com | Opsis AB, Furulund, Sweden<br>Instruments also available from:<br>Opsis, Inc.<br>146-148 Sound Beach Avenue<br>Old Greenwich, CT 06870<br>(203) 698-1810             |
| Advanced Pollution<br>Instrumentation, Inc.<br>6565 Nancy Ridge Drive<br>San Diego, CA 92121-2251<br>(619) 657-9800     | Envirronics, Inc.<br>69 Industrial Park Rd. E.<br>Tolland, CT 06084-2805<br>(203) 429-0077  | State of Oregon<br>Department of Environmental Quality<br>Air Quality Division<br>811 S.W. Sixth Avenue<br>Portland, OR 97204  |
| Andersen Instruments<br>500 Technology Court<br>Smyrna, GA 30082-9211<br>(800) 241-6898                                 | Graseby GMW<br>[Refer to Andersen Instruments]  | PCI Ozone Corp.<br>One Fairfield Crescent<br>West Caldwell, NJ 07006<br>(201) 575-7052   |
| ASARCO Incorporated<br>3422 South 700 West<br>Salt Lake City, UT 84119<br>(801) 262-2459                                | Horiba Instruments Incorporated<br>17671 Armstrong Avenue<br>Irvine, CA 92714<br>(800) 446-7422   | Phillips Electronic Instruments, Inc.<br>85 McKee Drive<br>Mahwah, NJ 07430  |
| Beckman Instruments, Inc.<br>Process Instruments Division<br>2500 Harbor Blvd.<br>Fullerton, CA 92634<br>(714) 871-4848 | Lear Siegler<br>[Refer to Monitor Labs, Inc.]   | Rupprecht & Patashnik Co., Inc.<br>25 Corporate Circle<br>Albany, NY 12203<br>(518) 452-0065   |
| Bendix<br>[Refer to ABB Process Analytics]  | Commonwealth of Massachusetts<br>Department of Environmental<br>Quality Engineering<br>Tewksbury, MA 01876  | Sibata Scientific Technology, Ltd.<br>1-25, 3-chome<br>Ikenohata, Taito-ku<br>Tokyo 110, Japan<br>81-3(3822)2272<br>TTani@email.msn.com                              |
| BGI Incorporated<br>58 Guinan Street<br>Waltham, MA 02154   | Met One Instruments, Inc.<br>1600 Washington Blvd.<br>Grants Pass, OR 97526<br>(541) 471-7111<br>metone@metone.com  | Thermo Environmental Instruments, Inc.<br>8 West Forge Parkway<br>Franklin, MA 02038<br>(508) 520-0430   |
| Columbia Scientific Industries<br>11950 Jollyville Road<br>Austin, TX 78759<br>(800) 531-5003                           | McMillan<br>[Refer to Columbia Scientific Industries]   | U.S. EPA<br>National Exposure Research Laboratory<br>Human Exposure & Atmospheric<br>Sciences Division (MD-46)<br>Research Triangle Park, NC 27711<br>(919) 541-2622 |
| Combustion Engineering<br>[Refer to ABB Process Analytics]  | Mine Safety Appliances<br>600 Penn Center Blvd.<br>Pittsburgh, PA 15235-5810<br>(412) 273-5101  | Wedding and Associates, Inc.<br>[Refer to Thermo Environmental<br>Instruments, Inc.]   |
| Dasibi Environmental Corp.<br>506 Paula Avenue<br>Glendale, CA 91201<br>(818) 247-7601                                  | Monitor Labs, Inc.<br>74 Inverness Drive<br>Englewood, CO 80112-5189<br>(800) 422-1499  |  |
| DKK Corporation<br>4-13-14 Kichijoji Kitamachi,<br>Musashino-shi<br>Tokyo, 180, Japan                                   |   |  |

# U.S. EPA REFERENCE & EQUIVALENT METHODS FOR AMBIENT AIR

May 9, 2000

| <u>Method</u>  | <u>Designation Number</u> | <u>Method Code</u> | <u>Method</u>  | <u>Designation Number</u> | <u>Method Code</u> |
|--|---------------------------|--------------------|--|---------------------------|--------------------|
| <b><u>SO<sub>2</sub> Manual Methods</u></b>                                |                           |                    |  |                           |                    |
| Reference method (pararosaniline)  | --                        | 097                | Beckman 952A   | RFNA-0179-034             | 034                |
| Technicon I (pararosaniline)   | EQS-0775-001              | 097                | Bendix 8101-B  | RFNA-0479-038             | 038                |
| Technicon II (pararosaniline)  | EQS-0775-002              | 097                | Bendix 8101-C  | RFNA-0777-022             | 022                |
| <b><u>SO<sub>2</sub> Analyzers</u></b>                                     |                           |                    |  |                           |                    |
| Advanced Pollution Instr. 100  | EQSA-0990-077             | 077                | Columbia Scientific Indust.1600, 5600  | RFNA-0977-025             | 025                |
| Advanced Pollution Instr. 100A   | EQSA-0495-100             | 100                | Dasibi 2108  | RFNA-1192-089             | 089                |
| Asarco 500   | EQSA-0877-024             | 024                | DKK Corp GLN-114E  | RFNA-0798-121             | 121                |
| Beckman 953  | EQSA-0678-029             | 029                | Environnement S.A. AC31M   | RFNA-0795-104             | 104                |
| Bendix 8303  | EQSA-1078-030             | 030                | Environnement S.A. SANOA   | EQNA-0400-139             | 139                |
| Columbia Scientific Industries 5700  | EQSA-0494-095             | 095                | Horiba APNA-360  | RFNA-0196-111             | 111                |
| Dasibi 4108  | EQSA-1086-061             | 061                | Lear Siegler or Monitor Labs ML9841,<br>ML9841A, Monitor Labs ML9841B,<br>Wedding 1030 | RFNA-1292-090             | 090                |
| DKK Corp. Model GFS-32   | EQSA-0701-115             | 115                | Meloy NA530R   | RFNA-1078-031             | 031                |
| DKK Corp. Model GFS-112E   | EQSA-0100-133             | 133                | Monitor Labs 8440E   | RFNA-0677-021             | 021                |
| Environnement S.A. AF21M   | EQSA-0292-084             | 084                | Monitor Labs or Lear Siegler 8840  | RFNA-0280-042             | 042                |
| Environnement S.A. SANOA   | EQSA-0400-138             | 138                | Monitor Labs or Lear Siegler 8841  | RFNA-0991-083             | 083                |
| Horiba Model APSA-360/APSA-360ACE  | EQSA-0197-114             | 114                | Opsis AR 500, System 300 (open path)   | EQNA-0495-102             | 102                |
| Lear Siegler AM2020  | EQSA-1280-049             | 049                | Philips PW9762/02  | RFNA-0879-040             | 040                |
| Lear Siegler SM1000  | EQSA-1275-005             | 005                | Thermo Electron or Thermo<br>Environmental Instruments 14B/E                           | RFNA-0179-035             | 035                |
| Lear Siegler or Monitor Labs ML9850,<br>Monitor Labs ML9850B, Wedding 1040 | EQSA-0193-092             | 092                | Thermo Electron or Thermo<br>Environmental Instruments 14D/E                           | RFNA-0279-037             | 037                |
| Meloy SA185-2A   | EQSA-1275-006             | 006                | Thermo Environmental Instr. 42, 42C  | RFNA-1289-074             | 074                |
| Meloy SA285E   | EQSA-1078-032             | 032                |  |                           |                    |
| Meloy SA700  | EQSA-0580-046             | 046                |  |                           |                    |
| Monitor Labs 8450  | EQSA-0876-013             | 513                |  |                           |                    |
| Monitor Labs or Lear Siegler 8850  | EQSA-0779-039             | 039                |  |                           |                    |
| Monitor Labs or Lear Siegler 8850S   | EQSA-0390-075             | 075                |  |                           |                    |
| Opsis AR 500, System 300 (open path)                                       | EQSA-0495-101             | 101                |  |                           |                    |
| Philips PW9700   | EQSA-0876-011             | 511                |  |                           |                    |
| Philips PW9755   | EQSA-0676-010             | 010                |  |                           |                    |
| Thermo Electron 43   | EQSA-0276-009             | 009                |  |                           |                    |
| Thermo Electron 43A or Thermo<br>Environmental Instruments 43B, 43C        | EQSA-0486-060             | 060                |  |                           |                    |
| <b><u>O<sub>3</sub> Analyzers</u></b>                                      |                           |                    |  |                           |                    |
| Advanced Pollution Instr. 400/400A   | EQOA-0992-087             | 087                |  |                           |                    |
| Beckman 950A   | RFOA-0577-020             | 020                |  |                           |                    |
| Bendix 8002  | RFOA-0176-007             | 007                |  |                           |                    |
| Columbia Scientific Industries 2000  | RFOA-0279-036             | 036                |  |                           |                    |
| Dasibi 1003-AH,-PC,-RS   | EQOA-0577-019             | 019                |  |                           |                    |
| Dasibi 1008-AH   | EQOA-0383-056             | 056                |  |                           |                    |
| DKK Corp. Model GUX-113E   | EQOA-0200-134             | 134                |  |                           |                    |
| Environics 300   | EQOA-0990-078             | 078                |  |                           |                    |
| Environnement S.A. O <sub>3</sub> 4IM                                      | EQOA-0895-105             | 105                |  |                           |                    |
| Environnement S.A. SANOA   | EQOA-0400-137             | 137                |  |                           |                    |
| Horiba APOA-360  | EQOA-0196-112             | 112                |  |                           |                    |
| Lear Siegler or Monitor Labs ML9810,<br>Monitor Labs ML9810B, Wedding 1010 | EQOA-0193-091             | 091                |  |                           |                    |
| McMillan 1100-1  | RFOA-1076-014             | 514                |  |                           |                    |
| McMillan 1100-2  | RFOA-1076-015             | 515                |  |                           |                    |
| McMillan 1100-3  | RFOA-1076-016             | 016                |  |                           |                    |
| Meloy OA325-2R   | RFOA-1075-003             | 003                |  |                           |                    |
| Meloy OA350-2R   | RFOA-1075-004             | 004                |  |                           |                    |
| Monitor Labs 8410E   | RFOA-1176-017             | 017                |  |                           |                    |
| Monitor Labs or Lear Siegler 8810  | EQOA-0881-053             | 053                |  |                           |                    |
| Opsis AR 500, System 300 (open path)                                       | EQOA-0495-103             | 103                |  |                           |                    |
| PCI Ozon Corp. LC-12   | EQOA-0382-055             | 055                |  |                           |                    |
| Philips PW9771   | EQOA-0777-023             | 023                |  |                           |                    |
| Thermo Electron or Thermo<br>Environmental Instruments 49, 49C             | EQOA-0880-047             | 047                |  |                           |                    |
| <b><u>CO Analyzers</u></b>   |                           |                    |  |                           |                    |
| Advanced Pollution Instr. 300  | RFCA-1093-093             | 093                |  |                           |                    |
| Beckman 866  | RFCA-0876-012             | 012                |  |                           |                    |
| Bendix 8501-5CA  | RFCA-0276-008             | 008                |  |                           |                    |
| Dasibi 3003  | RFCA-0381-051             | 051                |  |                           |                    |
| Dasibi 3008  | RFCA-0488-067             | 067                |  |                           |                    |
| Environnement s.a. CO1IM   | RFCA-0995-108             | 108                |  |                           |                    |
| Horiba AQM-10, -11, -12  | RFCA-1278-033             | 033                |  |                           |                    |
| Horiba 300E/300SE  | RFCA-1180-048             | 048                |  |                           |                    |
| Horiba APMA-360  | RFCA-0895-106             | 106                |  |                           |                    |
| Lear Siegler or Monitor Labs ML9830,                                       |                           |                    |  |                           |                    |
| Monitor Labs ML9830B, Wedding 1020   | RFCA-0992-088             | 088                |  |                           |                    |
| MASS - CO 1 (Massachusetts)  | RFCA-1280-050             | 050                |  |                           |                    |
| Monitor Labs 8310  | RFCA-0979-041             | 041                |  |                           |                    |
| Monitor Labs or Lear Siegler 8830  | RFCA-0388-066             | 066                |  |                           |                    |
| MSA 202S   | RFCA-0177-018             | 018                |  |                           |                    |
| Thermo Electron or Thermo<br>Environmental Instruments 48, 48C             | RFCA-0981-054             | 054                |  |                           |                    |
| <b><u>NO<sub>x</sub> Manual Methods</u></b>                                |                           |                    |  |                           |                    |
| Sodium arsenite (orifice)  | EQN-1277-026              | 084                |  |                           |                    |
| Sodium arsenite/Technicon II   | EQN-1277-027              | 084                |  |                           |                    |
| TGS-ANSA (orifice)   | EQN-1277-028              | 098                |  |                           |                    |
| <b><u>NO<sub>x</sub> Analyzers</u></b>                                     |                           |                    |  |                           |                    |
| Advanced Pollution Instr. 200  | RFNA-0691-082             | 082                |  |                           |                    |
| Advanced Pollution Instr. 200A   | RFNA-1194-099             | 099                |  |                           |                    |
| <b><u>Pb Manual Methods</u></b>  |                           |                    |  |                           |                    |
| Reference method (hi-vol/AA spect.)  | --                        | --                 |  |                           |                    |
| Hi-vol/AA spect. (alt. extr.)  | EQL-0380-043              | 043                |  |                           |                    |
| Hi-vol/Energy-disp XRF (TX ACB)  | EQL-0783-058              | 058                |  |                           |                    |
| Hi-vol/Energy-disp XRF (NEA)   | EQL-0589-072              | 072                |  |                           |                    |
| Hi-vol/Flameless AA (EMSL/EPA)   | EQL-0380-044              | 044                |  |                           |                    |
| Hi-vol/Flameless AA (Houston)  | EQL-0895-107              | 107                |  |                           |                    |
| Hi-vol/Flameless AA (Omaha)  | EQL-0785-059              | 059                |  |                           |                    |
| Hi-vol/ICAP spect. (Doe Run Co.)   | EQL-0196-113              | 113                |  |                           |                    |
| Hi-vol/ICAP spect. (EMSL/EPA)  | EQL-0380-045              | 045                |  |                           |                    |
| Hi-vol/ICAP spect. (Illinois)  | EQL-1193-094              | 094                |  |                           |                    |
| Hi-vol/ICAP spect. (Kansas)  | EQL-0592-085              | 085                |  |                           |                    |
| Hi-vol/ICAP spect. (Montana)   | EQL-0483-057              | 057                |  |                           |                    |
| Hi-vol/ICAP spect. (NE&T)  | EQL-1188-069              | 069                |  |                           |                    |
| Hi-vol/ICAP spect. (New Hampshire)   | EQL-1290-080              | 080                |  |                           |                    |
| Hi-vol/ICAP spect. (Pennsylvania)  | EQL-0592-086              | 086                |  |                           |                    |
| Hi-vol/ICAP spect. (Pima Co.,AZ)   | EQL-0995-109              | 109                |  |                           |                    |
| Hi-vol/ICAP spect. (Pima Co.,AZ)   | EQL-0995-110              | 110                |  |                           |                    |
| Hi-vol/ICAP spect. (Rhode Island)  | EQL-0888-068              | 068                |  |                           |                    |
| Hi-vol/ICAP spect. (Silver Val. Labs)                                      | EQL-1288-070              | 070                |  |                           |                    |
| Hi-vol/ICAP spect. (West Virginia)   | EQL-0694-096              | 096                |  |                           |                    |
| Hi-vol/WL-disp. XRF (CA A&IHL)   | EQL-0581-052              | 052                |  |                           |                    |
| <b><u>PM<sub>10</sub> Samplers</u></b>                                     |                           |                    |  |                           |                    |
| Andersen Instruments,RAAS10-100  | RFPS-0699-130             | 130                |  |                           |                    |
| Andersen Instruments,RAAS10-200  | RFPS-0699-131             | 131                |  |                           |                    |
| Andersen Instruments,RAAS10-300  | RFPS-0699-132             | 132                |  |                           |                    |
| BGI Model PQ100  | RFPS-1298-124             | 124                |  |                           |                    |
| BGI Model PQ200  | RFPS-1298-125             | 125                |  |                           |                    |
| Oregon DEQ Medium volume sampler   | RFPS-0389-071             | 071                |  |                           |                    |
| Rupprecht & Patashnick Partisol 2000                                       | RFPS-0694-098             | 098                |  |                           |                    |
| R & P Partisol-FRM Model 2000  | RFPS-1298-126             | 126                |  |                           |                    |
| R & P Partisol-Plus Model 2025 Seq.  | RFPS-1298-127             | 127                |  |                           |                    |
| Sierra-Andersen/GMW 1200   | RFPS-1287-063             | 063                |  |                           |                    |
| Sierra-Andersen/GMW 321-B  | RFPS-1287-064             | 064                |  |                           |                    |
| Sierra-Andersen/GMW 321-C  | RFPS-1287-065             | 065                |  |                           |                    |
| Sierra-Andersen/GMW 241 Dichot.  | RFPS-0789-073             | 073                |  |                           |                    |
| W&A/Thermo Electron Mod 600 HVL  | RFPS-1087-062             | 062                |  |                           |                    |
| <b><u>PM<sub>2.5</sub> Analyzers</u></b>                                   |                           |                    |  |                           |                    |
| Andersen Instruments Beta FH621-N  | EQPM-0990-076             | 076                |  |                           |                    |
| Met One BAM1020, GBAM1020,<br>BAM1020-1, GBAM1020-1                        | EQPM-0798-122             | 122                |  |                           |                    |
| R & P TEOM 1400, 1400a   | EQPM-1090-079             | 079                |  |                           |                    |
| W&A/Thermo Electron 650 Beta Gauge   | EQPM-0391-081             | 081                |  |                           |                    |
| <b><u>PM<sub>2.5</sub> Samplers</u></b>                                    |                           |                    |  |                           |                    |
| Andersen Model RAAS2.5-200 Audit   | RFPS-0299-128             | 128                |  |                           |                    |
| BGI PQ200/200A   | RFPS-0498-116             | 116                |  |                           |                    |
| Graseby Andersen RAAS2.5-100   | RFPS-0598-119             | 119                |  |                           |                    |
| Graseby Andersen RAAS2.5-300   | RFPS-0598-120             | 120                |  |                           |                    |
| R & P Partisol-FRM 2000  | RFPS-0498-117             | 117                |  |                           |                    |
| R & P Partisol-Plus 2025   | RFPS-0498-118             | 118                |  |                           |                    |
| R & P Partisol 2000 Audit  | RFPS-0499-129             | 129                |  |                           |                    |
| Thermo Envr Model 605 CAPS   | RFPS-1098-123             | 123                |  |                           |                    |
| URG-MASS100  | RFPS-0400-135             | 135                |  |                           |                    |
| URG-MASS300  | RFPS-0400-136             | 136                |  |                           |                    |
| <b><u>TSP Manual Method</u></b>  |                           |                    |  |                           |                    |
| Reference method (high-volume)   | --                        | --                 |  |                           |                    |
|  |                           |                    |  |                           |                    |